Three Tails of Organizational Innovation: from the Value Creation Perspective

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Three Tails of Organizational Change: from the Value Creation Perspective

Abstract

Several prior articles have emphasized the importance of organizational innovation and change. To advance our understanding, this paper seeks to address the following question: “in what ways the outcome of organizational innovation process distributed over time” by examining organizational innovation process with the knowledge creation perspective.

To explore this supposition, this paper conducted multiple case studies. A qualitative approach was chosen due to the lack of prior research and is appropriate for establishing empirical evidence and describing the phenomenon of the innovation process. The adoption of E-Learning is a good setting to study organization design for innovation which can often be a change that requires the adopting organizations to perform radical reengineering and adjustment in a relatively comprehensive manner.

The result indicated two critical dimensions of presenting the organizational innovation process: two-way interactive triggers for organizational innovation integrating three levels – individual, group and organization, and three tails of organizational innovation process. By exploring the organizational innovation process, this study has extended the Rogers’ landmark article (1995) by indicating three different organizational innovation processes with different value impact, named “three tails”. It also contributed knowledge to the literature on organizational innovation process by describing value creation and transfer among individuals, groups and organizations. More importantly, these three tails are not isolated but integrated - this can be viewed as three stages for organizational innovation process.

Keywords: organizational innovation, organizational innovation process and value creation

1. Introduction

The importance of organizational innovation and organizational innovation process is now well recognized, especially in the product development (e.g. Hage, 1999; Lozada & Calantone, 1996; Van de Ven, 1993). Despite the recognition of the importance of organizational innovation, there has been little research on the distribution of organizational innovation outcome. With a few exceptions, e.g. Jacobides et al.(2006) stated that value creation was one benefit from innovation.

This paper seeks to contribute to the literature on organizational innovation process by examining the following question: in what ways the outcome of organizational innovation process distributed over time? In addressing this question, our specific focus is on the organizational innovation process, and also provides insights into the knowledge creation perspective.

Much of the prior research is limited in two ways. First, it has primarily taken an organizational routine view (Becker & Zirpoli, 2008), however, it mainly focuses on the "standard operating procedures" and "stable behaviour patterns". Second, innovation life cycle (Westerman, McFarlan, & Iansiti, 2006) has focused on stages of innovation. None of the above research explores how the outcome of organizational innovation distributes, by which ways or how long the effort can last. To address these limitations, this paper: (1) examines the processes of organizational innovation (2) develop a theoretical model of organizational innovation "tails" (The definition of 'tail' in this paper comes from Fleming (2007)) with knowledge creation perspectives.

Most articles which researched on both innovation and value creation indicate that innovation is the trigger of value creation, and value capture as one resource of value creation (Lepak, Smith, & Taylor, 2007). This research tries to use the perspective of value creation to

examine the efforts of organizational innovation to present the impact of value creation on different organizational innovation processes.

We conducted three detailed case studies of longitudinal changes in organizational innovation. The cases seems to best fit the organizational innovation process (Rogers, 1995), albeit with some modifications. Thus, this paper integrates the literature from the area of organizational innovation and offers new insights into the knowledge creation point of view. We first develop the theoretical background for the paper, and explain the research methodology. We then describe each case and draw some conclusions from them. Finally, the paper's findings, limitations, and implications are discussed.

2. Theoretical Development

2.1 Organizational Innovation

Organizations are "*socially defined and operate within a web of values, norms, rules and beliefs and taken-for-granted assumptions that they represent values, interests and cognitive schemas of organizational and institutional actors which are hard to change*" (Hinings, Thibault, Slack, & Kikulis, 1996). Rogers (1995) defines an innovation as "*an idea, practice or object that is perceived as new by the individual, and diffusion as the process by which an innovation makes its way through a social system*". Some researchers define organizational innovation as "*a process of bringing new, problem-solving, ideas into use*" (Amabile, 1998). Mezias and Glynn (1993) defined organizational innovation as "*non-routine, significant, and discontinuous organizational change that embodies a new idea that is not consistent with the current concept of the organization's business*". Despite the differences found between these definitions, organizational innovation has been consistently used to describe an organization's behaviour when adopting and introducing new ideas into the organization (e.g. (Oerlemans, Meeus, & Boekema, 1998; Zammuto & O'Connor, 1992).

Innovation is a means of changing an organization (Damanpour, 1991) to respond to changes in its internal or external environment, or as an anticipatory action to influence on its environment. Even in the most stable environment, organizations still need continuously to innovate in order to survive (Hage, 1980; Mezias & Glynn, 1993). Hence, organizational innovativeness can best be conceptualized as multiple rather than single innovation. This point is reflected in the notion that innovation constitutes parts of the system that produces it (Lam, 2004), suggesting that organizational innovation is an ongoing collective creation process (Van de Ven & Poole, 1995). In addition to the conceptual value, a better understanding of organizational innovation can also contribute to the practice of management (Leifer et al., 2000; van de Ven, 1986). From the managerial perspective, the primary purpose of innovation is to introduce change in the organization in order to create new opportunities or take advantage of the existing ones (Drucker, 1985).

In addition to identifying what organizational innovation means, many scholars emphasize the distinction between the “diffusion” and “adoption” of innovations (e.g. Kimberly & Evanisko, 1981), while others differentiate “innovating” from “innovativeness” (van de Ven, 1986). One of the key purposes of differentiating between “diffusion” and “adoption” and between “innovating” and “innovativeness” is that diffusion and innovating refer to the process through which innovation occurs and evolves. By contrast, adoption and innovativeness represent a snapshot to highlight the status and reality of organizational innovation.

In relation to the technology diffusion literature, researchers have usually perceived technological innovation within an organizational context as an organization’s efforts to initiate, adopt, and/or implement one or more emerging technology (Fichman, 2000; Prescott & Conger, 1995). What is reflected in these accounts is that technological innovation has a close relationship with organizational innovation. More importantly, organizations which can

manage innovation well typically demonstrate not only an understanding of both the technology and the context in which it will be used, but also the creation of an organizational environment to foster frequent and ongoing innovation that absorptive capacity is more than merely previous knowledge.

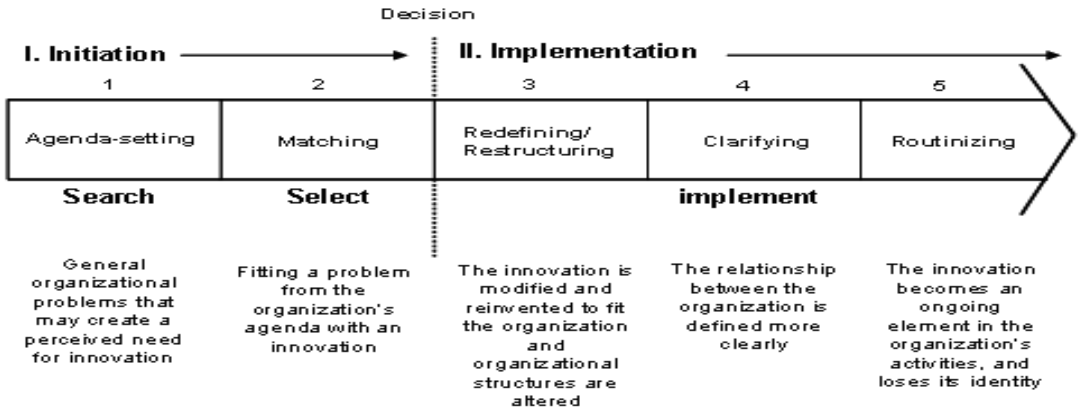
2.1.1 The Process of Organizational Innovation

More recently, there has been a significant shift in the focus of conceptualizing organizational innovation and a move away from the inquiry into formal structures towards an understanding of organizational processes, relationships and boundaries (Pettigrew & Fenton, 2000). The process of innovation is argued to consist of four distinctive steps, starting with the generation of an idea, the dissemination of the proposed idea, decisions to adopt, and, finally, implementation (Lozada & Calantone, 1996)

This approach to conceptualize the organizational innovation process represents a significant shift in the way in which such processes were understood. For example, similar to Zaltman et al (1973), most studies of organizational innovation addressed organizational innovativeness by seeing an organization as a whole and its innovation as a collective result, without identifying how such a result was achieved. However, in the 1980s, many areas of research, namely communication technology, management information systems and computing, have started to emphasize the importance of organizational innovation from the individual process point of view (Van de Ven & Rogers, 1988). Another vital trend that was evident in the 1980s is the incorporation of computer-related equipment into the conceptualization of organizational innovation. Despite the popularity of examining the impact of IT, it is argued by Rogers (1995) that many prior accounts have failed to take into account sufficiently the characteristics of IT when theorizing organizational innovation.

Based on the accounts of Rogers (1995) and Bowes (1997), organizational innovation processes should consist of four key elements, including the innovation itself, the communication channels to transmit the innovation knowledge, a mechanism to track innovation adoption over time, and the social system within which individual adopters exist(shown in Figure 1). Other models, for example that of Tidd, Bessant, & Pavitt (2005), also describe the innovation process in a similar fashion by portraying organizational innovation as a simple linear flow.

Figure 1 The Organizational Innovation Process (Roger 1995, *p392*)



Despite the fact that Rogers' account laid down a vital foundation to theorize the organizational innovation process, some limitations related to his framework are also evident. For example, it is pointed out by King and Anderson (1995) that his innovation process framework is far too complex, yet failed to capture the dynamics of organizational innovation by using such as a linear pattern.

In summary, to pursue its goal of examining the tails of organizational innovation, this paper draws upon the Roger's diffusion model (Rogers, 1995). It provides an open ending of innovation process that undergoes changes over time and types.

2.2 Value Creation

Value creation is a central concept in the management and organization literature for both micro-level (individual, group) and macro-level (organization theory, strategic management) research (Lepak et al., 2007). For more than two thousand years, philosophers and economists studied and debated the various meanings and significance of the concept of value (Young, 1978). Philosophers and ethicists, for example, study the values held by an individual or groups of individuals, such as a society. They deal with the principles or values that should guide human behaviour. (Haksever, Chaganti, & Cook, 2004). Due to different disciplines' focus, the types of sources for the value creation can be divided into individual or group, organization and society (Lepak et al., 2007). There are few researcher focus on the individual level, except Felin and Hesterly (2007) who contend that the understanding of the value creation process must begin at the individual level of analysis. Value creation has long been stressed in the business literature as the main objective of organizations (Haksever et al., 2004). The value may be different with the stakeholders' diversity in the organization as Haksever et al., (2004) stated that '*some activities of the firm may create benefits or rewards for one group, while reducing benefits for another group, or increasing costs or risks for them*'. They defined three value dimensions for employees: financial, nonfinancial, and time. What is value? Based on *'Value' in resource-based theory* by Bowman and Ambrosini (2000), resources are *assumed* to be valuable, and there are two types of value at the organizational level of analysis: use value and exchange value. Until now there are still various options regarding the definition of value creation and the process of value creation and value capture. Lepak et al.(2007) stated that value creation and value capture should be viewed as distinct processes, since the source that creates a value increment may or may not be able to capture or retain the value in the long run. They also argued that the concept of value creation was "not well understood", because there is little consensus on what value creation is or on how it

can be achieved (Lepak et al., 2007). Value creation is a first imperative and value capture/ sharing is a second order qualifying condition (Jacobides et al., 2006).

Innovation is the source of value creation (Schumpeter, 1934), and value creation indicates how actors can benefit from innovation (Jacobides et al., 2006). Teece (1986) presented the link of who can benefit from innovation to the contractual conditions surrounding the innovation. The value is captured from the commercialization of an innovation (Chesbrough & Rosenbloom, 2002). Knowledge is the primary resource underlying new value creation (Felin & Hesterly, 2007; Payne, Storbacka, & Frow, 2008). The most distinctive and inimitable resource available to organizations is knowledge that enables them to effectively employ, manipulate, and transform various organizational resources (Sung-Choon, Morris, & Snell, 2007). Organizational knowledge is embedded in a variety of entities, such as tools, tasks, technologies, and people, people-embodied knowledge (Argote & Ingram, 2000).

3. Research Methodology

To explore the supposition, we conducted multiple case studies. A qualitative approach was chosen due to the lack of prior research, the desire to understand the innovation process with different tails within the rich organizational contexts, and the sensitive nature of the data needed (Yin, 1984). In order to understand the thought processes underlying major changes made along the way, it was essential to incorporate the different views of stakeholders. At the same time, in order to achieve some understanding of the different aspects of organizational innovation process, we wanted to examine them in multiple cases. Three detailed case studies were conducted.

The adoption of electronic learning (E-Learning) is a good setting to study organization design for innovation (e.g. Westerman et al., 2006). E-Learning was considered a discontinuous change in budgeting, organizational relationships, policy, procedures, and culture (Alshara & Alsharo, 2007). It can often be a change that requires the adopting

organizations to perform radical reengineering and adjustment in a relatively comprehensive manner.

The case sites were selected based on a combination of accessibility (to different aspects of staff involved), representativeness (the pioneer university in the E-Learning development), and cross-case diversity (Sabherwal, Hirschheim, & Goles, 2001). To fulfil the proposed objectives of this research, three cases were conducted in a university context. We use the University of Nottingham as the research context, three school E-Learning projects (school of mathematics, school of geography, and school of education) to represent the three cases. The three projects are in different time stages. The E-Learning projects in the school of mathematics and school of geography are internal projects, and the E-Learning project in the school of education is international, collaborating with Chinese universities.

Table 1 The Main Factors for the E-Learning Projects

	MELEES Project	Geography E-Learning Project	eELT Project
Background	School of Mathematics	School of Geography	School of Education
User	Students of Engineering and Science	Students of Geography school	Chinese English language teachers
Time	2002-2005	2004-2008	2003-2006
Core Team	Project leader, co-ordinator, Technologist	Project co-ordinator	University of Nottingham, Beijing Normal University and Beijing Foreign Studies University
Platform	WebCT	WebCT	Moodle
E-Learning Material	HTML with PDF output	Podcasting, based on flash format (using Xerte)	Developed by flash engine and HTML format

3.1 Data Collection

Aligning with one of the objectives of conducting a process research, various data sources that are vital to the process research, including observation, interviewing and archival documents (Van de Ven & Huber, 1990), were used. In this study, a four-year period of observation was carried out was to experience how E-Learning development. There are two

types of documentation were collected in this research which come from both university level and school level.

The interviewees targeted and selected for this research spread down from the top management, central information system to the academic staff. The pro-vice chancellor, several project managers and members of the central information system team were interviewed. At the school level, the researcher interviewed all of the core team members for all three projects. It is vital to note that there are three types of staffs involved in the school projects, including the core team members who were involved in developing and driving the project, the academic staff who implemented the outcome of the project or were involved at a later stage and the students or staff who were the end users of the projects. It was equally critical to take into account the fact those organizational members who were not involved in the projects at the school level, but involved in the E-Learning development. In total, 68 interviews were conducted for the research. The majority of the interviews lasted between 60 and 90 minutes and were recorded with the interviewees' permissions. Most of the interviews were conducted based on an interview guide that was based on the key themes that this study aimed to explore. Requests for follow-up interviews were also made at the end of several interviews. In total, there were 15 follow-up interviews conducted, mainly to ask further questions and clarify the ambiguities that arose during the initial interviews.

3.2 Data Analysis

For each case, we examined the way in which the organization changed over time, through rigorous analysis of extensive interview transcripts and organization documentation. Being based on three cases, our results may seem particularistic. However, we tried to produce more general explanations (Eisenhardt, 1989) through "analytic generalization" (Yin 1984), where "*the generalization is of theoretical concepts and patterns*" (Orlikowski, 1993, p310). The concepts and patterns were linked to the existing theory on punctuated equilibrium models

and on Roger innovation model (1995). A three-step process was followed: step 1: visual mapping strategy, step 2: pattern-matching, step 3: cross-case analysis

Miles and Huberman (1994) suggest that graphical presentations are useful in many regards. Firstly, this strategy allows large quantities of information to be presented in little space. In addition, a large number of dimensions can be simultaneously displayed, allowing the researcher to develop and to verify theoretical innovations. Such dimensions are, e.g., parallel processes, passage of time and different actors.

An attempt was made in this study to make sense of the sequence of events by studying them in a graphical form. During the pilot study, this research produce a graphical presentation of a single case, in which it was possible to embed different organizational levels, actors, commitments made, driving forces, elapsed time and some outcomes. Conceptualization in graphical form, therefore, seems most useful in gaining an overall view on a specific sequence of events. However, as is warned by Langley (1999), the graphical presentation has a tendency to become overly simplified or too complex. Graphical presentation turned out to provide a good starting point for this study, and it also proved useful as a communication tool with the other researchers and practitioners involved.

This research is based as multiple-cases in a single context. Yin (2003) implied that pattern matching logic is one of the common and popular techniques for case study analysis. The concept of pattern-matching is "*a situation where several pieces of information from the same case may be related to some theoretical proposition*"(Campbell, 1975). In the other words, pattern matching is a consistent mechanism linking the data to propositions (Campbell, 1975; Campbell, 1966). This is also part of the data analysis process. Furthermore, the consequent task of linking, attempting to relate or matching theories which might obtain similar observed pattern and receive support (Trochim, 1989).

the cross-case analysis can be preferably used for pattern matching (Eisenhardt, 1989). By cross-case analysis, the accuracy and reliability of theory can be improved. This research employed cross-case analysis techniques proposed by Eisenhardt (1989). The method proved useful and efficient since it enabled the comparison of different cases from the chosen perspectives, which would not have been possible otherwise.

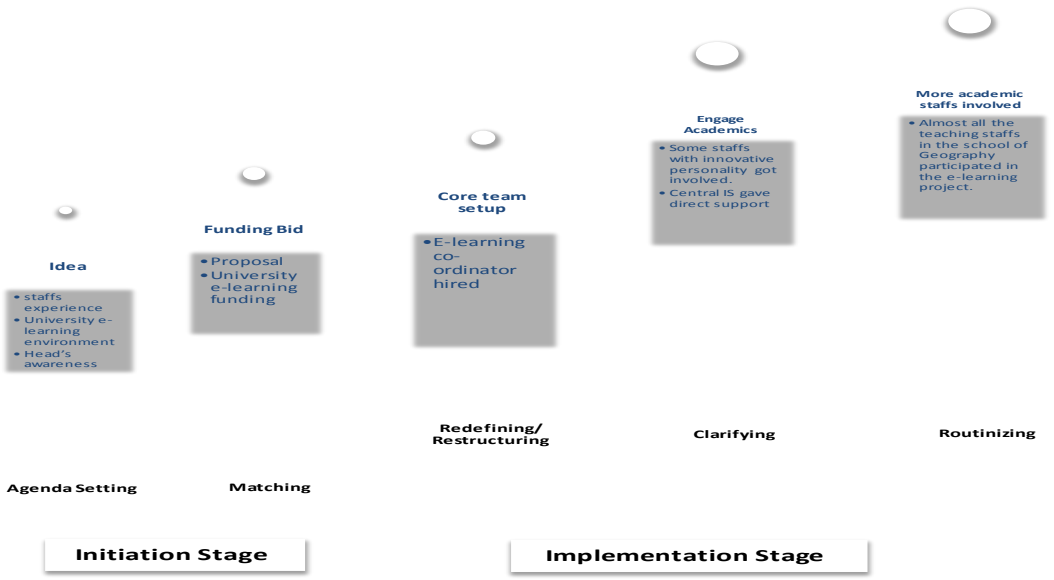
4. Within-Case Analysis

To analyse the three case studies, the research applied Rogers' (1995) organizational innovation process model as the basis. As outlined in Figure 1, this framework is useful in categorizing various events that seemed to happen with very limited interconnection during their development into a logical order. The experience gained by applying this framework is that it provides a unified template for examining each case study and becomes a highly effective tool for making sense of the differences and similarities between the three case studies. Before the close similarities and wide differences can be outlined, this section first elaborates on the analysis result for each case, based on Rogers' framework.

4.1 Case Study One— the School of Geography E-Learning Project

The E-Learning project at the School of Geography began in 2004, a later start than that of other projects examined in this paper. Nevertheless, the development process of E-Learning was by comparison much smoother. Using the model of organizational innovation developed by Rogers (1995), this process is illustrated in Figure 2, divided into two stages, notably the initiation stage and the implementation stage:

Figure 2 Geography Organizational Innovation Process



Initiation Stage

There are several reasons why the E-Learning project was initiated in the School of Geography. Firstly, there was already a prevailing culture within the School to use technology to supplement learning, since, although there was no E-Learning-related initiative yet implemented, there were plenty of technology-based supplementary materials, such as online mini games and videos, produced by members of staff to enhance the students' learning experience. It is unsurprising that the decision to introduce E-Learning into the School very quickly became a shared view among most of the staff. Secondly, from the time when the E-Learning strategy group was formed in 2000, up to 2004, the experience of E-Learning development in the school and at university level was already very mature. Due to the fact that many schools have already implemented E-Learning courses online, large numbers of students, including those from the School of Geography, have experienced E-Learning through participating in courses offered by other departments. Thirdly, E-Learning was promoted by the University, particularly from the senior management. Triggered by these three influences, the decision formally to launch the E-Learning project in the School of Geography was announced by the department head in 2004.

Compared to MELEES, which was 100% funded by the University, the E-Learning project in the School of Geography was partly funded by the School. Based on the evidence collected from the three case studies, it is clear that the University's willingness to fund projects 100% has started to decrease.

Implementation Stage

After the decision to fund the E-Learning project proposed by the School of Geography was approved by the University, the first step in the implementation stage was to recruit staff to oversee it. The post created during this stage was that of E-Learning project coordinator. The technician worked for the MELEES project was selected as the best candidate for this post with more than a year of experience of the MELEES project. Unlike the other case studies, which have a project team to roll-out the project, in the School of Geography the E-Learning project coordinator is solely in charge of the project, with the support of other academic staff.

The E-Learning project coordinator's experience with the MELEES project has equipped her with some valuable experience, even though the subject areas are primarily related to mathematics. Compared to other schools' E-Learning projects, which typically did not have a strong team with the right combination of IT skills and E-Learning project implementation experience, the project in the School of Geography was very different. Further, having excellent experience in collaboration and a connection with the Central Information System Department has helped significantly in ensuring the smooth implementation of the project. With a strong interest, the E-Learning project coordinator is an active person involved in the Central E-Learning Focus Group.

Despite the fact that the decision to implement the E-Learning project in the School of Geography was a top-down process, the development process can be characterised as a continuous effort of engagement. The E-Learning project coordinator began by disseminating

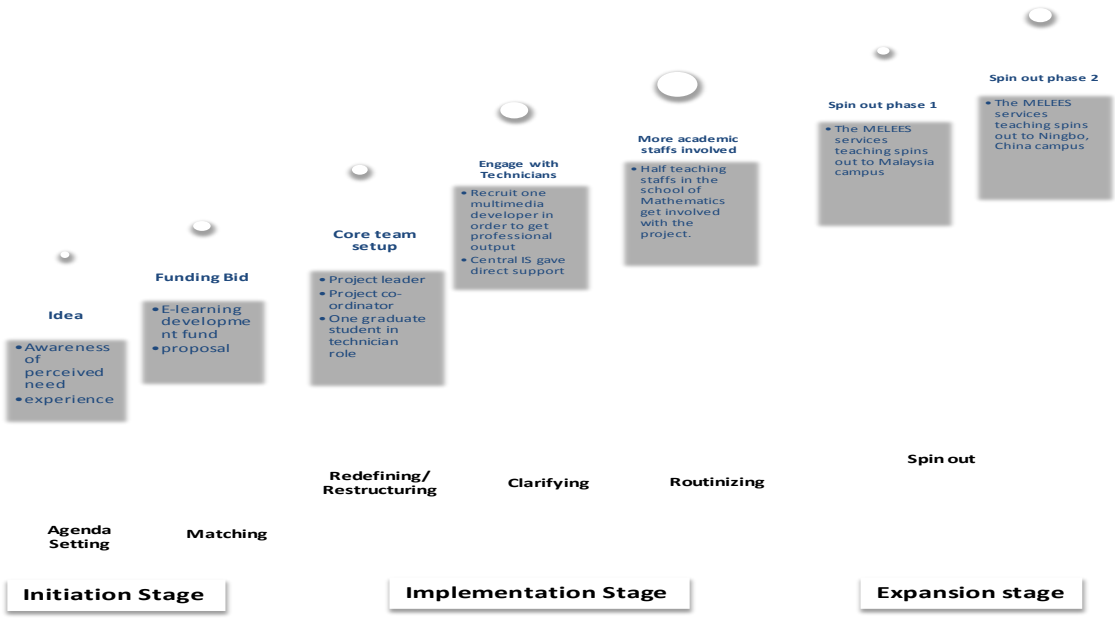
of E-Learning project information to all academic staff and whoever was interested in developing an E-Learning course could receive advice from her. Her contribution lies not only in assisting with the design of E-Learning materials, but also in providing the knowledge to apply the technology. A routine was gradually established for the development process. Even though the project started with only a few young academic staff, it has since spread throughout the department. With the project coordinator's energy and assistance, almost all teaching staffs in the School of Geography have participated in E-Learning. This not only demonstrates a great achievement, but also provides evidence to showcase the routinizing activity that forms the basis of the implementation stage.

With the growing maturity of using E-Learning on a very comprehensive scale, it is becoming increasingly apparent that having one person to manage all E-Learning-related activities is insufficient. This insufficiency is reflected in two different areas: firstly, in the mounting administration related to the use of E-Learning (for example, providing students with feedback and sorting out the contents); and, secondly, the need for renewing and updating materials. Furthermore, it is clear that academic staff have become more experienced in evaluating the effectiveness of E-Learning tools and the results that these tools yield. Revising existing materials and replacing with new technologies has therefore become a fresh agenda for the department. This case study illustrates well how a new technology-based solution, such as E-Learning, can be quickly adopted and matured in an organization. Far from discouraging innovation, there is a need to continue and renew this innovation by introducing further improvements. This demonstrates the ongoing dynamic of innovation and the driving forces behind its continuity.

4.2 Case Study Two —MELEES Project

MELEES' organizational process can be categorized in three stages: initiation, implementation and expansion (Figure 3). Compared to the framework proposed by Rogers, it is clear that the organizational process underlying the development of MELEES offers greater complexity. Such complexity is captured in the expansion stage.

Figure 3 MELEES Organizational Innovation Process



Initiation Stage

Compared to the other two case studies, the MELEES project can be considered an early starter. Initiated in 2002, the project was heavily influenced by the HELM (Helping Engineers Learn Mathematics) project, which was founded by HEFCE (Higher Education Funding Council for England) in 1998. As one of the project members of HELM, the MELEES project leader gained significant experience in computer-assisted learning and applying new technology to help his students to learn mathematics. These elements led to the realisation that E-Learning can provide a useful approach to the teaching of mathematics.

Such an understanding served as the source of inspiration for the project. In particular, when the University's E-Learning strategy group called for E-Learning bids, the project leader reacted quickly and completed an integrated proposal. In addition, he also received support from a senior staff member who was the leader of the Teaching and Learning Community of his School.

Implementation Stage

The implementation stage involves three periods. After the MELEES project leader received the funding, he and his co-coordinator sought people with the required skills to convert their idea into reality. A research assistant created the MELEES template during the pilot, a very important milestone in the project's implementation. To date, the template resulting from the MELEES project is still broadly used in the School.

The start of the second period was marked by the appointment of a full-time technician. With the technician's excellent social skills, she was capable of engaging not only the Central IS Department, but also the academics. In 2005, the technician managed to complete another 17 modules and involve 20 teaching staff in the project. So far, about a third of all teaching staffs at the School of Mathematics have participated in the development of MELEES, and as a result, E-Learning has become the most important alternative approach for students when learning mathematics. Outside the School, the quality of service teaching remained highly satisfactory. MELEES has been hugely successful, becoming a role model for many institutions in the UK.

Expansion Stage

From the aspect of innovation, the impact of MELEES will not cease when the project officially finishes. In addition to being a source of inspiration for other higher education

institutions, the University has been exploring the possibility of extending the success of MELEES to its overseas campuses. For example, in 2007, the team has engaged with the IS staff of the Malaysian campus. Further, the University is anticipating its first trial at the China campus. The underlying aim of this is twofold: firstly, to reproduce the success of MELEES by utilising the existing available expertise and experience; and, secondly, to meet the challenge of providing high quality service teaching, particularly to students on overseas campuses. This stage, as an extension to Rogers' (1995) framework of the innovation process in organizations, characterises an organization's belief in capitalising its existing innovation.

4.3 Case Study Three— the eELT Project

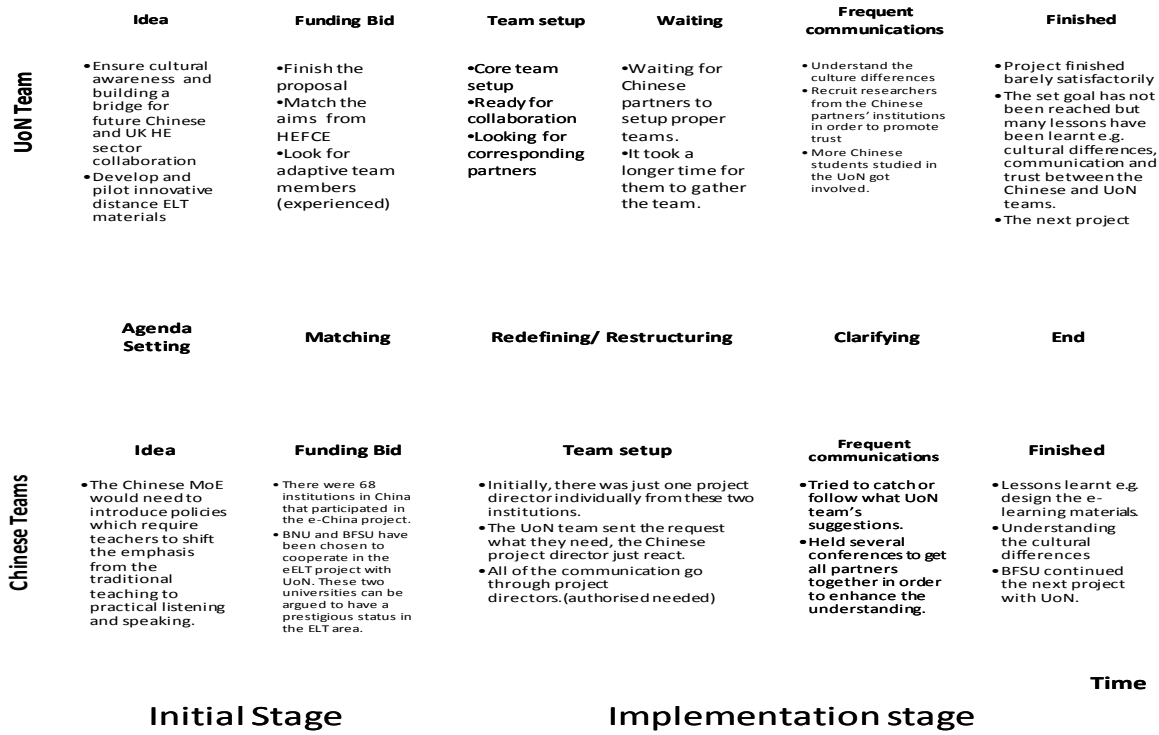
The eELT project team involved three geographically-dispersed sub-teams located at the University of Nottingham), Beijing Normal University and Beijing Foreign Studies University. The eELT case is a pioneering cross-culture E-Learning project. One of the key aspects of this project is that it involves some changes to the traditional approach to teaching English as a foreign language. The project created some valuable opportunities to enable experts from different universities, located in two different countries, to collaborate. In particular, useful lessons generated from this project are described not only in evaluating the strengths and weaknesses of the traditional face-to-face method, but also in recommending with a new alternative.

The eELT project's organizational innovation process is based on Rogers' (1995) framework, with some modifications. This case is very interesting, when comparing the two teams. In particular, the teams have undergone identical processes, yet demonstrated rather different behaviour. Figure 4 illustrates in more detail the organizational development stages and different behaviour of each team.

Initial Stage

The eELT project is a sub-project of an e-China programme. The overall aim of the e-China programme was to establish a strategic collaboration between UK and China in the higher education sector. The focus of this collaboration was to promote innovative developments in E-Learning for training teachers who teach English as a foreign language. The Chinese Ministry of Education would like to promote new pedagogical approaches to develop the sociable competencies of listening and speaking. Additionally, through the collaboration, the UK higher education institutions can gain experience in multi-cultural E-Learning innovation.

Figure 4 eELT Organizational Innovation Process



HE	Higher Education	HEFCE	Higher Education Funding Council for England
MoE	Ministry of Education	BNU	Beijing Normal University
BFSU	Beijing Foreign Studies University	UoN	University of Nottingham

For the eELT project, the participating universities in the UK submitted their proposals to compete for funding, and at the same time, they were seeking qualified members to participate. However, the fund bidding process in China is rather different. The two eELT partners were chosen directly by the Chinese Ministry of Education, because of their prestigious status in the area of English language teaching.

Implementation Stage

The ways in which the Chinese and British teams were formed were very different. The University of Nottingham team was based on the principle that each member, already identified when the proposal was submitted, possessed a unique set of experiences needed for the project. The team structure is flat. However, each team from China only had a project leader and a university director, without any other team members. Between the two projects there is a programme director who is responsible for both teams. The lack of project team members clearly caused some communication difficulties. For instance, initially, when members of the University of Nottingham team needed to negotiate with the reciprocal member in the Chinese team, they could deal only with the project leaders. This led to inevitable delays.

Once the teams had been formed, the project was able to begin. However, cultural differences impeded collaboration. These differences were found in many areas, including defining the aims and objectives and the technological terms, and even in the writing of materials. In order to reduce the cultural gap and build trust, the University of Nottingham team decided to recruit some PhD researchers from the Chinese partner universities, yet these attempts, the Chinese teams still encountered difficulties. There was a clear need to improve communication amongst the teams, so several face-to-face meetings and conferences were organised as a result.

5 Cross-case Analysis and Discussion

The authors compared several organizational innovation models (Damanpour, 1991, Damanpour and Gopalakrishnan, 2001, Van de Ven and Poole, 1995, Van de Ven, 2007, Rogers, 1995), however, the outcomes of E-Learning innovation in organization are used to depended on types of subject, leaderships, organization size and some complexity of objectivity issues ……etc. Therefore, the authors adopted the linear model which proposed by Rogers (1995) as the basis for the organizational innovation in E-Learning in order to simplify the comparison procedures. In particular, Rogers' framework is an effective tool to clarify the difference and similarities across the cases.

5.1 Triggers for Innovation

For both research and practice, most E-Learning innovation within organizations begins with the question: "Why adopt E-Learning?" Research on E-Learning adoption indicates that although the numbers of courses that incorporate ICT (Information Communication Technology) have increased dramatically in the last five years, E-Learning as such has not reached its potential (Elgort, 2005). The first stage of Roger's model also starts with "ideas" of adopting innovation. This paper found that the triggers for E-Learning innovation vary according to different contexts. By analyzing the E-Learning innovation at school and university levels, three types of triggers were found for E-Learning innovation:

1) E-Learning Bandwagon Pressure to University as a Trigger for E-Learning Innovation

Organizational change is typically triggered by a relevant environmental shift that, once sensed by the organization, leads to an intentionally-generated response (Porras & Silvers, 1991). The reason for the E-Learning adoption in the University of Nottingham is not only because of the demands from its individual staff, but also from pressure from outside the University.

As Clegg et al. (2003) stated, the specific external drivers in relation to using new media are varied. Leaders of elite universities see the potential to capitalise on their international reputation. The University of Nottingham, as in other universities, is also inevitably facing the vigorous challenges of the digital world. During the E-Learning bandwagon of the dot-com era, E-Learning is viewed by many as a "killer app" of the Internet (Oblinger & Kidwell, 2000). Universities, as the investors, seek to put their money into E-Learning start-ups because they believe that there will be huge payoffs. After 2000, almost 90% percent of all universities in the US, such as New York University Online, the University of Illinois On-line, and most of the universities in the UK - for example, the University of Warwick, Imperial College and the majority of universities in the Russell Group, have an individual E-Learning plan (Svetcov, 2000) in the face of pressures from serious competition. The trend was for universities to be afraid of being left behind by their competitors; they believed that E-Learning would bring them additional strength and benefits.

Porras and Silvers (1991) also argued that organizational development is triggered not only by current environmental mismatches but also by an organization's desire to fit into future environmental niches. There have been more recent attempts in the field of Higher Education to restructure through the adoption of new forms of governance and managerialism (Salter & Tapper, 2000) with a top down approach (Clegg et al., 2003).

Based on the experience gained from the early implementation of E-Learning, some lessons became apparent to the decision makers at university level. Firstly, there was a need to standardise the technology used to power the E-Learning. This was evident in the decision to select WebCT as the official E-Learning platform for the University. Secondly, there was a need to expand the scope of E-Learning activities as a means of achieving economies of scale. For instance, utilising E-Learning to facilitate service teaching and introducing E-Learning to different campuses are just two of the many examples which showcased the University's

efforts to maximise the impact and potential of E-Learning. Thirdly, there was a need to continue reforming the organisational structure in order to maximise the usage of the existing available resources; for instance, having the Central Information System Department to coordinate the technology has helped the university to cut down the cost of appointing one or more technicians for each school. Moreover, with the creation of the E-Learning Strategy Group and the Learning and Teaching Committee, the University can be more selective in funding E-Learning projects which are able to yield more potential for other schools.

2) The Interest of Individual Staff Members as a Trigger for E-Learning Innovation

Teaching innovation initiated by individual staff members was found to be one of the most crucial triggers for E-Learning innovation. As observed in the case studies, some individuals applied new technology to enhance their teaching before the E-Learning project had been formally established in the university. Initially, even though there was no centralised E-Learning innovation strategy or committee available at university level, the University and most Schools have adopted an attitude that permitted all staff to apply new concepts to innovate their teaching. When an increasing number of staff became involved, some pressure started to emerge at school level - for instance, in the case study of MEELES. Fishbein and Ajzen's (1975) theory of reasoned action posits that an individual's behaviour is a function of both their attitude toward a specific behaviour and the social influences and norms surrounding that behaviour (Jebeile & Reeve, 2003).

Over the last two decades considerable research has been conducted into the adoption by individuals of new technology in a variety of settings (Jebeile & Reeve, 2003). From the 1960s, language teachers were considering alternative ways to assist learning (Barson & Debski, 1996), from behaviouristic and communicative learning to integrated learning, which along the timeline indicates a trend for computer-assisted language learning. From its early

days, drill-and-practice for integrated learning was applied to computers in order to increase the integration between learners and instructors.

Traditionally, lecturers in Higher Education have control over the individual curricula and teaching methodologies, so they can choose innovative ways using any media (Clegg et al., 2003). From the 1990s, personal computers have gradually become an indispensable aid for teachers and students within a variety of disciplines. Teachers started to utilize the computer as a tool to enhance their teaching performance. In traditional classroom teaching, students can be isolated and lack motivation. Through developing computer technology, some teachers who were technologically-advanced users initiated activities using computers as supplements to the traditional teaching methods in multi-disciplines e.g. Education, Geography and Mathematics.

This research found that within the university there was no formal E-Learning strategy to popularize E-Learning before 2000, and only some staff members developed courses with multi-media solutions. However, the pressure of developing E-Learning within the university is increasing due to the Internet and the development of related technology, and also to the increased demands on teaching. This trend matches the viewpoint of organizational development which states that organizational change is usually triggered by the failure of people to create continuously adaptive organizations (Weick & Quinn, 1999). Organizational development occurs in response to modest mismatches with the environment and produces relatively moderate adjustments in those segments of the organization not congruent with the environment (Porras & Silvers, 1991). Some research studies stated that the E-Learning strategy attempted to employ both top-down and bottom-up approaches to implementation (Sharpe, Benfield, & Francis, 2006). As stated in the previous section, the present research found that top management of the University is one trigger of E-Learning innovation;

however, this research has also found that individuals adopt a positive role which also triggers to the E-Learning innovation.

3) Pressure from Schools as a Trigger for E-Learning Innovation

As this research stated above, universities attempted to employ both a top-down strategy and bottom-up implementation (Sharpe et al., 2006); attention therefore needs to be drawn to the importance of schools which are embedded between top management and individual staff.

Some staff at school level also experienced the advantages of E-Learning and championed the adoption of the new technology to innovate teaching within their school. This pressurised the schools examined in this study to change in order to be competitive and also to reduce costs. However, before they could adopt E-Learning the schools needed more time to understand the advantages it could bring. More importantly, schools would require substantial resources from the university to fund the innovation. The demand for resources at the school level therefore became a vital force for the university to approach E-Learning strategically from the aspects of pedagogical innovation and of resource distribution and utilisation.

The pressure from schools to innovate their pedagogy then became a driving force to trigger some changes at university level. For example, the establishment of the E-Learning Strategy Group to manage and coordinate E-Learning initiatives was a necessary step in order to accommodate the continuous development of E-Learning activities. Given that the amount of investment required for E-Learning is very substantial, it was vital for the university to utilize and mobilize the available resources effectively, covering finance, technology and knowledge.

Few research studies mentioned the importance and impact of schools during the organizational change. Sharpe et al (2006) observed that the role of the school in E-Learning

innovation is to follow university strategy. The University produced and distributed a template for a school strategy with a covering memo that clearly explained why they had been asked to do this and what the benefits would be (Sharpe et al., 2006). Fitz (1994) also explained that schools are needed to promote E-Learning and to encourage bottom-up activity. This research found that E-Learning innovation is not a one-way approach in response to top-down strategy, but an interactive one with the school adopting the role of both trigger and follower.

Gamoran et al. (1997) argued that the strategy and activities of the schools were principally a response to the external environment. The present research found the external environment - including competition and collaboration with other universities - is an important motivation for schools to engage in E-Learning. For example, the experience of collaborating with similar projects at other universities enhanced the involvement in E-Learning by the School of Mathematics; also the project by the E-Learning Strategy Group was generated partly due to the competing pressure from Schools of Education in other universities conducting E-Learning research. This is also observed by Woods et al. (1998): "*competing pressures and values have a significant bearing on schools' strategies and changes*" *(p181).*

It is clear from the above discussion that innovation at individual and school level represented two sources of input which were vital for triggering changes at university level. Moreover, to accommodate, coordinate and maximise the E-Learning efforts the university could not simply stand still. Rather, transformational innovation occurred as the university gained from the various E-Learning innovation activities occurring within the institution.

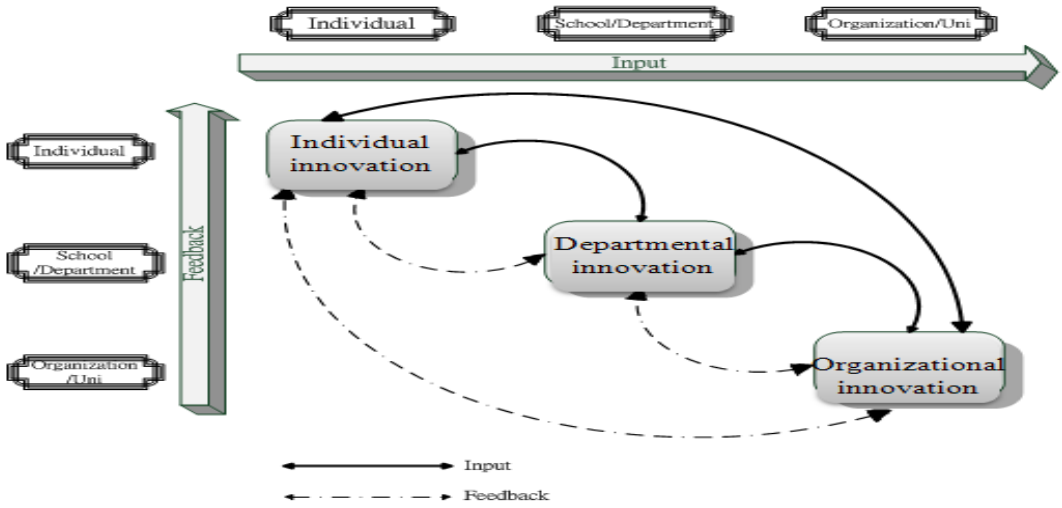
4) Integration of the Three Triggers of E-Learning Innovation

Most research focuses on the first and second triggers (individual and university level) as found in this research. For example, Toffler (1985) suggests that significant organisational

change only occurs when three conditions are met: "*First, there must be enormous external pressures. Second, there must be people inside who are strongly dissatisfied with the existing order. And third, there must be a coherent alternative embodied in a plan, a model, or a vision*" *(p. 14).* However, the present research also found that in order to sustain E-Learning developing throughout the university, it is essential to consider the trigger from school level. Senge (1990) argued very strongly that learning organisations require all employees to be involved in change processes and it should not be left to senior managers to drive top-down change. Jones and O'Shea (2004) pointed out that the management of universities represents a very formidable challenge for vice-chancellors, their management teams and governors - even when judged against many other public or private sector organisations. It reveals how universities undertake the transition of combining top-down deliberate strategy with bottom-up emergent strategy (Jones & O'Shea, 2004). However there is little research on the link between top-down and bottom-up strategies. This present research argues an interactive approach involving the three levels - individual, school and university.

Furthermore, few research studies focus on organizational innovation at these three levels, especially in E-Learning. Examining the theory of organizational learning, Crossan et al. (1999) firstly addressed an "organizational learning framework" with three-level interaction: individual, group and organization. However, according to this theory, the individual is the trigger of organizational learning only; this present research found that group and organization are also triggers. In the framework presented by Crossan et al. (1999), the interrelation within three levels is described as a one-way approach; in comparison, this research found a two-way interactive trigger approach and therefore proposes a revised framework for the triggers of organizational innovation (Figure 5) which indicates interactive role-playing within the three levels, demonstrated below:

Figure 5 Triple Trigger of Organizational Innovation



Organizational innovation that took place at university level was found to cascade down to school and individual levels. For example, in order to provide quality support to the growing number of E-Learning projects in the various schools, Xerte was launched by the Central Information System Department. The academics can therefore devote more time to developing content, while the Central Information System Department can concentrate on providing platform support and technological advice to the newly- formed E-Learning projects.

Organizational innovation taking place at university level also serves as a feedback mechanism for impacting on E-Learning innovation decisions and activities at school and individual levels. For instance, the E-Learning Strategy Group was established as a central body for making E-Learning-related decisions; it aims not only to approve or disapprove the E-Learning funding proposals submitted by each school, but also to reinforce the strategic objectives of E-Learning formed by the University. The Central Information System Department is a vital feedback mechanism influencing departmental E-Learning innovation. Despite the fact that many technological standards and infrastructures were already established, the expertise from the Central Information System Department is still extremely

valuable to various schools. This is particularly evident in the introduction of Xerte by the Central Information System Department, illustrated earlier.

Despite the fact that the level of maturity in departmental innovation varies among schools, the common aim to enhance the students' learning experience through technology remains the same. The growing maturity in understanding how E-Learning can facilitate individual innovation certainly helps the three Schools to reinforce the E-Learning strategy proposed by the University, and to be flexible and creative in arriving at solutions to achieve their goal. Moreover, each of the three Schools examined by this study has demonstrated a very coherent viewpoint towards E-Learning innovation, which impacts significantly on individual academic staff. For example, in the case study of the School of Geography, the ultimate goal of its E-Learning is to make all of its modules available online. By so doing, the students will be provided with a choice between the conventional learning and E-Learning methods. The school therefore also plays a role in promoting continuously innovative teaching among its academic staff.

The E-Learning project in the School of Geography is a typical example, launched by these three triggers together. There are several reasons why the E-Learning project was initiated in the School of Geography. Firstly, the culture already existed within the School of Geography to use technology to supplement learning, since, although there was no E-Learning-related initiative yet implemented by the School, there were many technology-based supplementary materials (e.g. online mini games, videos) produced by members of staff to enhance the students' learning experience. It is unsurprising that the decision to introduce E-Learning into the School very quickly became a shared view among most of the staff. Secondly, from the time when the E-Learning strategy group was formed in 2000, until 2004, E-Learning development in the school and at university level became well established. Due to the fact that many schools have already implemented E-Learning courses online, considerable

numbers of students, including many from the School of Geography, have experienced E-Learning through participating in courses offered by other departments. Thirdly, E-Learning was promoted by the university, particularly by the top management. Triggered by these three forces, the decision formally to launch the E-Learning project in the School of Geography was announced by the School head in 2004.

5.2Three Tails of Organizational Innovation Process

A comparison of three case studies reveals that, although most steps of organizational innovation processes are similar in case studies fitting the first four stages of Rogers' model, there are three types of "last stage", named "three tails" (Figure 6), as described in this research. These three tails can indicate three different organizational innovation processes with different value coverage impact (Figure 7). More importantly, these three tails should be integrated to enable comprehensive understanding.

Figure 6 Three Tail of Organizational Innovation Process

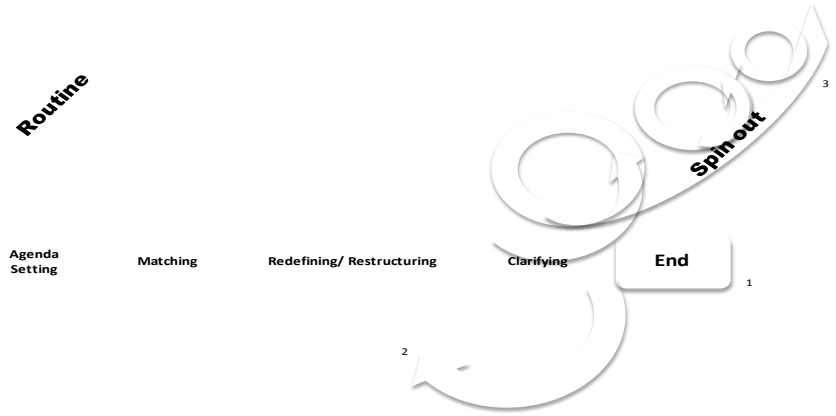
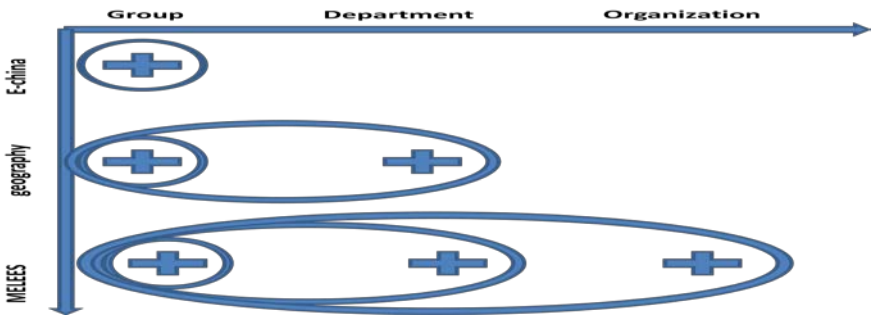


Figure 7 The Coverage of Value Creation within Three Case Studies



1) Tail One — "End" Stage (eELT E-Learning Project)

This research found that the E-Learning innovation process of the eELT E-Learning project ceased when the project finished (shown in Figure 6, "type 1"). This type is similar to the theory of "organizational life cycle". Models of life cycle stages are not new in the literature on organizations (Jawahar & McLaughlin, 2001). According to life-cycle theorists, innovation tends to increase and facilitate organizational success during the early stages of a firm, then slowly decreases and hinders success during the later stages (Koberg, Uhlenbruck, & Sarason, 1996).

The eELT E-Learning project is an example of how the innovation decreased and finally ended with the project's termination. From the value creation point of view, in the organizational innovation process with tail one, the value mostly spread only within the project group. Research by Felin and Hesterly (2007) indicated that the value was created by individuals at the beginning; similarly Nonaka's studies (1994) also stated that "*an organization cannot create knowledge without individuals. The organization supports creative individuals or provides a context for such individuals to create knowledge*" *(p17).* In order to gain better understanding and communication, the value or knowledge/information was exchanged within group members, and with other University group members (shown in Figure 7). It also proved that interaction between individuals has the effect of sharing and

developing knowledge, not only through language but also by observation, imitation and practice (Nonaka, 1994).

There is no doubt that the importance of the eELT E-Learning project impacts on the development of E-Learning within the University, especially with the purpose of "international collaboration" (Marshall and Mitchell, 2002). The reasons why the value mainly exists within groups is due to several reasons. Firstly, knowledge complexity mainly affects transfer difficulty (Hansen, 1999; Teece, Pisano, & Shuen, 1997). Unlike the other two case studies, the eELT project is a pioneer cross-culture E-Learning project which differs from Rogers' research setting. These two research teams are based on backgrounds from totally different cultures. The knowledge therefore created by the eELT project is more complex than other E-Learning projects in the University of Nottingham, thus creating barriers for knowledge capture by other staff or groups. Secondly, the indirectly-related knowledge makes it difficult to extend knowledge to other groups (Hansen, 1999). Because the E-Learning platform and course concept of eELT are different from other E-Learning projects, this makes it difficult to transfer knowledge to other groups.

2) Tail Two— "Routine" Stage (Geography E-Learning Project)

There are two essential stages in Rogers' framework - the initiation and implementation phases. The E-Learning project in the School of Geography seems to fit best into Rogers' framework for two reasons. First, the School of Geography is a single organization which matches Rogers' research setting. Second, the School was more recently established within the University of Nottingham's E-Learning development timetable, which means they could benefit from of relevant experience, thus avoiding unnecessary difficulties.

The results from this research can be fitted into the theory of "organizational routines" (shown in Figure 6, type 2). Organizational routines are considered the basic components of

organizational behaviour (Becker, Lazaric, Nelson, & Winter, 2005) and there must be a certain amount of stability to the conditions influencing behaviour within existing recurrent activities and interaction (Becker & Zirpoli, 2008). At the beginning of the E-Learning project of the School of Geography, the E-Learning concept was actively accepted and implied by the staff with high personal motivation; after a period, more and more staff became aware of the benefit of E-Learning from the pioneer staff. The routines that appeared since the introduction of E-Learning were admired by most staff in the School. E-Learning became a common channel for teaching, and the same stable and familiar behaviour routines continue (Becker et al., 2005).

From the perspective of value creation, the value/ knowledge is transferred from a group level to a school level (shown in Figure 7). One reason why the knowledge can transfer successfully is due to the related information (Hansen, 1999) as mentioned in the last section, which suggests that the experience or technology of E-Learning in teaching Geography is more or less similar. Another reason can be explained as "creation of new advantage" where the harvest created by the E-Learning core team members provides greater information and knowledge that can be used by other school members to combine and exchange this information in a way that produces new organizational knowledge (Lepak et al., 2007). The third reason may be because of "leadership" which influences value creation and capture (Nonaka, 1994). As this research has stated, the E-Learning in the School of Geography is fully supported both by the Head of School and by the E-Learning coordinator who is highly experienced, very supportive in enhancing staff motivation, and who provides the discretion needed to take appropriate actions to achieve needs/goals.

3) Tail Three— "Spin Out" Stage (MELEES E-Learning Project)

We also can find initiation and implementation phases in the MELEES case study. However, after the implementation phase, the MELEES did not come to an end - as the result of this highly successful project. MELEES rolled out to the overseas campus and inspired the innovations which form an extension to Rogers' framework. This research named this as tail 3 – "spin out" (shown in Figure 6, type 3).

Many researchers mentioned that knowledge transfer is firmly connected to the concept of learning organization (Gilbert & Cordey-Hayes, 1996). Szulanski (1996) pointed out that the success of many organizations can be based on their ability to transfer the knowledge embodied in organizational routines from one organization unit to another. Since 2000, the University of Nottingham has exerted great efforts to popularize E-Learning, not only over campuses in the UK but also on other overseas campuses (Malaysia and China). The MELLES E-Learning project is one case study which presents the University's ability and effort to encourage value transfer. Although the value transfer takes place within the University, the most suitably supportive theory is "inter-organizational learning/knowledge transfer" (Albino, Garavelli, & Schiuma, 1999).

In addition to the importance of "related knowledge" and "leadership" (Hansen, 1999; Nonaka, 1994) - discussed in the previous section - another important feature of inter-organizational value transfer is leader status, from which others can learn about what brings success and failure (Holmqvist, 2003). This research also found that organizational rules are also very important (Zhou, 1993), especially for the efforts of inner-organizational marketing which spread information to the imitative party. Another critical factor for successful value transfer is the support or collaboration by the original party (Holmqvist, 2003).

5.3 Propositions of the Three Tails' Integration

Previous section presented three tails which indicate three different organizational innovation processes with different value coverage impact. More importantly, these three tails are not isolated but integrated. These three tails also can be viewed as three stages for organizational innovation process. Taking the MELEES project, for example - before it went to tail 3, it passed through tail 1 and tail 2. The relations within these three tails are explained as Figure 8. This research tries to propose the relations within the three tails as following:

Beside the reason of project purpose, the initial motivators for tail 1 are personal interest and to gain understanding & communication within group members. The knowledge/value can be exchanged by language, observation, imitation and practice.

The barriers which block tail 1 to tail 2, or tail 2 to tail 3 are quite similar. The main barriers are:

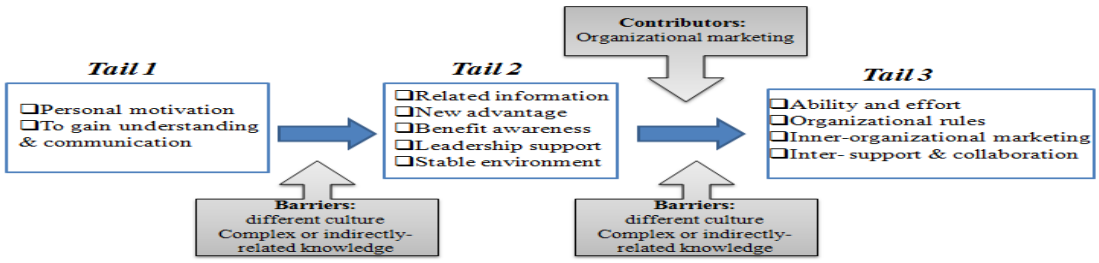
- Different cultures: the diversity of organizational structures and people's behaviours make the value transfer difficult to imitate from the group level to department level or one organization to another organization.
- Complex or indirectly- related knowledge: as mentioned above, one of the initial motivators is personal interest which the imitators aware the benefits. However, the complex or indirectly-related knowledge makes them difficult to follow.

The routine in the tail 2 not only need that the core team creates new advantage and related knowledge to other department staffs, but also the leadership support, especially for enhancing the awareness of benefits. The stable environment is another important factor which allows staffs easy to apply without the fear of further changes.

The main contributor transferring from tail 2 to tail 3 is organizational marketing which promotes the success of tail 2 to the whole organization. With the inner-organizational

marketing, the sub-organization which aware the benefits and the possibility of imitation gets the support not only from the top management but also the experienced sub-organization. The organizational marketing and support presents the organizational rules and the ability & effort to encourage the value transfer.

Figure 8 The Relations within Three Tails



6 Conclusions

The result indicated two critical dimensions of presenting the organizational innovation process: triggers for organizational innovation and three tails of organizational innovation process. This research argued that the triggers for E-Learning innovation vary according to different contexts with an interactive approach involving the three levels - individual, group and organization - and observed that most previous research focused only on the triggers at individual and university levels. Based on the organizational learning framework developed by Crossan et al (1999) which elaborated that the individual was the trigger of organizational learning only, this present research demonstrated that group and organization are also triggers, proposing a revised two-way interactive trigger framework for innovation.

By exploring the organizational innovation process, this study has extended the Rogers' theory (1995) by indicating three different organizational innovation processes with different value coverage impact, named "three tails". It also contributed knowledge to the literature on organizational innovation process by describing value creation and transfer among

individuals, groups and organizations. More importantly, these three tails are not isolated but integrated - this can be viewed as three stages for organizational innovation process.

Despite its significant contribution to knowledge, this investigation into innovation has some obvious limitations that are not yet overcome, and more research effort is called for. The period of E-Learning development in higher education is usually quite long; for example, E-Learning was first officially embedded at the University of Nottingham in 2000 and to date, the first generation of development has not yet been completed, especially the technological innovation cycle. Many higher education institutes are in the same situation. In order to develop a more comprehensive organizational innovation process, the employment of a longitudinal approach will enable future research to observe the organizational changes.

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